MUSIC SYNCHRONIZATION ARRANGEMENT

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a continuation application of U.S. patent application Ser. No. 14/243,613, which is expected to issue as U.S. Pat. No. 9,230,527, entitled "Music Synchronization Arrangement," filed Apr. 2, 2014, which is a divisional of U.S. patent Ser. No. 13/079,620 filed Apr. 4, 2011, which is continuation U.S. Pat. No. 7,973,231 filed Mar. 10, 2010, which is a continuation of U.S. Pat. No. 7,705,230 filed Feb. 6, 2009, which is a continuation of U.S. Pat. No. 7,521,623 filed Nov. 24, 2004, all of which are incorporated by reference herein for all purposes.

BACKGROUND OF THE INVENTION

[0002] Field of the Invention

[0003] The present invention relates to portable media devices and, more particularly, to improved features for managing and outputting media items.

[0004] Description of the Related Art

[0005] There exist today many styles of sound machines such as home stereos, car stereos, boom boxes, CD players, and hand-held music players (e.g., MP3) for outputting music. Hand-held music players in particular have become increasingly popular as they allow a user to listen to music on the go. That is, because of their size, they can easily be transported wherever the user travels. In some cases, the devices are attached to the user, as for example, using a belt or clip, thereby making them even easier to transport. In fact, because of their ease of transport, they are commonly used when exercising. The user can wear the music player thereby leaving their hands free to exercise. The iPod® manufactured by Apple Computer of Cupertino, Calif. is one example of a hand-held MP3 player.

[0006] In most cases, the music stored in music player is downloaded from a host device such as a personal computer. The personal computer can include music management software that allows a user to sort, store and catalog their music. More particularly, the music management software gives the user the ability to organize their music into playlists, play music, purchase music over the Internet (World Wide Web), run a visualizer to display the music in a visual form, encode or transcode music into different audio formats such as MP3, AIFF, WAY, AAC, and ALE, and transfer music between the personal computer and the music players. iTunes® manufactured by Apple Computer of Cupertino, Calif. is one example of music management software.

[0007] A personal computer may also include other software programs associated with music. By way of example, the personal computer may utilize recording software that allows a user to perform, record, and create music. These types of programs typically include features such as instruments, pre-recorded loops, amps, effects and editing tools. GarageBand® manufactured by Apple Computer of Cupertino, Calif., is one example of a music recording program.

[0008] The personal computer may also utilize mixing software that allows a user to perform DJ mixing, live remixing, and mix recording using music in various formats such as MP3. This type of software typically performs many functions including mixing, equalizing, cross fading, looping, tempo determination, pitch and tempo adjustment, etc. In order to synchronize two songs during mixing, mixing programs may be configured to analyze the music files and create beat marks for each song (annotate all the beats of the songs so that they can be matched efficiently during mixing).

[0009] Furthermore, in order to adjust the tempo of a song without affecting pitch, mixing programs may utilize a technique called phase vocoding, which is one of the more powerful methods of manipulating sounds in the frequency domain. Only recently have personal computers had sufficient processing to make real-time phase vocoding a viable proposition. I n the past, algorithms for phase vocoding were of such complexity and personal computers were of limited processing power such that it would often require many hours of processing to acquire each second of audio output. Traktor DJ Studio 2.0 manufactured by Native Instruments of Germany is one example of a mixing program.

[0010] Although music player systems utilizing a music player and personal computer work well, there is a continuing need for improved features for managing and outputting music.

SUMMARY OF THE INVENTION

[0011] The invention relates, in one embodiment, to a music method performed on a hand-held computing device. The method generally includes designating an attribute of a song. The method also includes controlling the music output of the computing device based on the designated attribute of the song. The attribute may, for example, correspond to the tempo of the song.

[0012] The invention relates, in another embodiment, to a method performed on a hand-held computing device. The method includes designating a tempo. The method also includes adjusting the tempo of one or more audio tracks being outputted to match the designated tempo.

[0013] The invention relates, in another embodiment, to a method performed on a hand-held computing device. The method includes storing a plurality of audio tracks. Each audio track having a tempo. The method also includes designating a tempo. The method further includes selecting audio tracks from storage with a tempo similar to the designated tempo.

[0014] The invention relates, in another embodiment, to a computer readable medium contained on a hand-held music player and including at least computer code for managing music. The medium includes obtaining the tempo of an event. The medium also includes outputting music. The medium further includes controlling the tempo of the music being outputted based on the tempo of the event.

[0015] The invention relates, in another embodiment, to a hand-held media player. The hand-held media player includes a housing of the media player. The hand-held media player also includes an accelerometer disposed inside the housing of the media player and configured to measure the motion of the media player. The hand-held music player further includes a music storage element disposed inside the housing of the media player and configured to contain one or more music items. The hand-held media player additionally includes a processor disposed inside the housing of the media player, and operatively coupled to the accelerometer and the music storage element. The processor is configured to control the output of the music items based on the motion of the media player.